

**Introduction:**

Bird and reptile eggs are the world’s largest single cells and can be used to study the activities of normal microscopic cells. They are especially useful in the study of osmosis and diffusion. Osmosis is the diffusion of water through a selectively permeable membrane. Water will diffuse into a cell or out of a cell depending on the concentration of water on each side of the membrane. Water will always move from an area of greater concentration to an area of lesser concentration. In this lab, you will observe the effects of osmosis on cells.

**Materials:**

1. Plastic Cups
2. Egg (one per pair)
3. Vinegar
4. Sugar Solution
5. Distilled Water
6. Balance or scale

**Hypothesis:**

Day 2 –

Day 3 –

**Procedure:**

Day 1

1. Get an egg from Mr. Owdij. Make sure the egg is not cracked or leaking in any way. If it is, return the egg and get a new one. Then get a plastic cup from Mr. Owdij and write your names across the top with a marker.
2. Be sure to give your egg a name. It will be your partner in this lab for a few days!
3. Mass out your fresh egg and record the information in the data section below.
4. Record a predicted mass after one day in your data table.
5. Fill your cup with vinegar and place your egg inside. Try to have as much of your egg in the vinegar as possible (it will slightly float). Place your cup to the side.

Day 2

1. After one day in the vinegar, take out your egg very carefully. It will be very fragile. Avoid touching it with your nails.
2. Pat dry the egg and determine its mass carefully. Record the mass in the data tables below.
3. Rinse out your cup and place your egg back in. Once everything has been recorded bring your egg to Mr. Owdij. He will cover your egg in a sugar solution.
4. Record a hypothesis based on what you think will happen if you leave the egg in sugar solution until the next school day. Record that in the hypothesis section under “Day 2”. Record a predicted mass after one day in your data table.

Day 3

1. After one day in the sugar solution, take out your egg very carefully. It will be very fragile. Avoid touching it with your nails.
2. Rinse off and pat dry the egg and determine its mass carefully. Record the mass in the data tables below.
3. Rinse out your cup and place your egg back in. Once everything has been recorded bring your egg to Mr. Owdij. He will cover your egg in pure water.
4. Record a hypothesis based on what you think will happen if you leave the egg in pure water until the next school day. Record that in the hypothesis section under “Day 3”. Record a predicted mass after one day in your data table.

Day 4

1. After one day in the pure water, take out your egg very carefully. It will be very fragile. Avoid touching it with your nails.
2. Pat dry the egg and determine its mass carefully. Record the mass in the data tables below.
3. Dispose of your egg carefully in a trash container.

**Data:**

Initial mass of the egg - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ grams

|  |  |  |
| --- | --- | --- |
| Day 1 | | |
| Solution Egg is Soaked In | Predicted Mass of Egg After 24 Hours | Actual Mass of Egg After 24 Hours |
| **Vinegar** |  |  |

|  |  |  |
| --- | --- | --- |
| Day 2 | | |
| Solution Egg is Soaked In | Predicted Mass of Egg After 24 Hours | Actual Mass of Egg After 24 Hours |
| **Sugar Solution** |  |  |

|  |  |  |
| --- | --- | --- |
| Day 3 | | |
| Solution Egg is Soaked In | Predicted Mass of Egg After 24 Hours | Actual Mass of Egg After 24 Hours |
| **Water** |  |  |

Conclusions:

1. Based on your observations, what effect did the vinegar have on the egg?
2. Was the vinegar (Day 1) a hypotonic, hypertonic or isotonic solution? Explain how your data supports this conclusion.
3. Was the sugar solution (Day 2) a hypotonic, hypertonic or isotonic solution? Explain how your data supports this conclusion.
4. Was the pure water (Day 3) a hypotonic, hypertonic or isotonic solution? Explain how your data supports this conclusion.